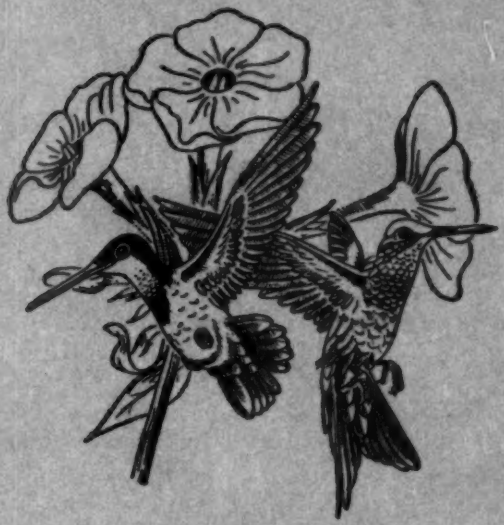
AVICULTURAL MAGAZINE



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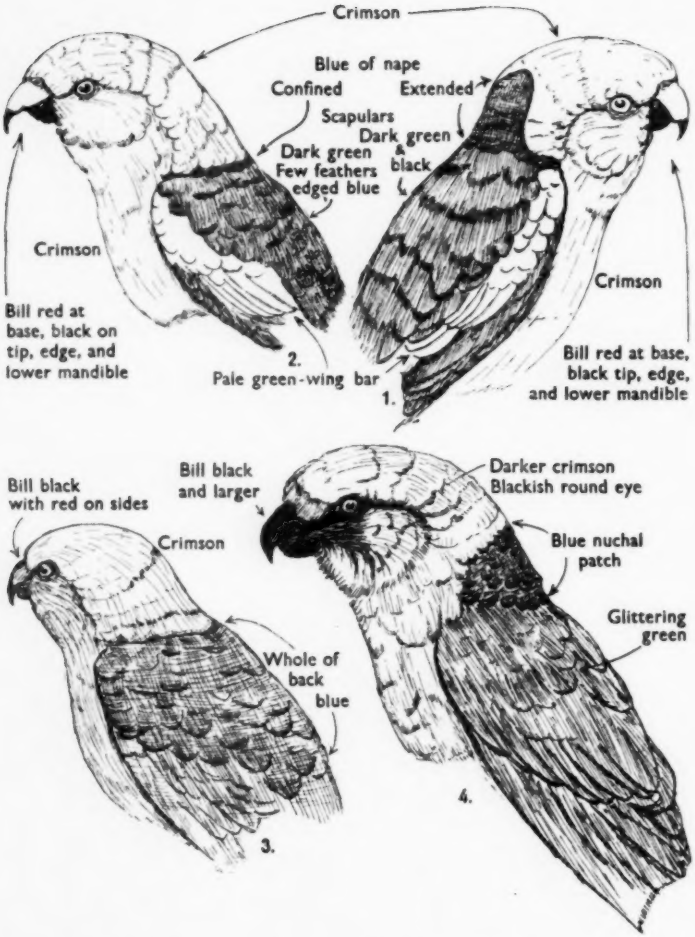

1. Green-wing King ; 2. Wilhelmina's variety ;
3. Salwatty King ; 4. Red Shining Parrakeet

AVICULTURAL MAGAZINE

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CRIMSON-WINGS, KINGS, AND SHINING PARRAKEETS

Their affinities and differences

By E. N. T. VANE

(Great Missenden, Bucks., England)

This series of extremely handsome, large parrakeets range over the south-west regions of the Pacific, being found in Australia and New Guinea, whence they extend in one direction through the islands of the Moluccas and Celebes, and in the other—after a distinct break in the range—to the insular groups of the Fiji and Tonga Islands. Peters listed them in his " Checklist " as :—

Aprosmictus, Gould (1842)—The Crimson-wings.
Alisterus, Mathews (1911)—The Kings.
Prosopeia, Bonaparte (1854)—The Shining (or Musk) Parrakeets.

The sketch shows :—

1. *Alisterus chloropterus chloropterus* (male), Green-wing King.
2. *Alisterus chloropterus wilhelminae* (male), Wilhelmina's variety.
3. *Alisterus amboinensis dorsalis* (either sex), Salwatty King.
4. *Prosopeia tabuensis splendens* (either sex), Red Shining Parrakeet.

It is difficult to convey the impression of colour values in a black and white sketch, but the distinction between the two first races is fairly apparent, as apart from the blue markings on the nape and hind neck they are almost identical in males and entirely so in females. The scapulars of *chloropterus* are almost completely blackish green, whereas in *wilhelminae* some of these feathers are bordered terminally with deep blue, at least in the specimens compared in the British Museum.

Although Figs. 3 and 4 resemble each other superficially in life, their true differences are slightly exaggerated in the sketch. In the first place the three species of *Alisterus* are all much the same size—about

15 inches in overall length as compared with the larger *Prosopeia* (some 18 inches long). The crimson colour is deeper in the latter, especially in the face where it becomes much blackened in the ocular region ; also the green of the body, although of similar " tone " value, is distinctly more glittering in character. In *splendens* too, the blue nuchal patch is smaller, and the primaries and edge of wing are lighter blue ; no blue shows on the under tail-coverts ; the under wing-coverts are brighter blue with some red flecks. In the specimen of *dorsalis* from which the sketch was made, practically the whole of the scapulars and back were entirely deep blue ; though a specimen that lived in my aviaries for several years—during which period she established her sex by laying several eggs—only had a small, narrow area, little more than a ring, as her nuchal patch, though most of the feathers of the scapulars were broadly edged terminally with blue, and the lower back and the upper surface of the tail were all deep blue. This specimen was loaned for preservation when it died, but unfortunately the friend who had the skin was killed in a street accident and I was unable to secure its return under the circumstances and it was lost entirely. The sexes of *dorsalis* are alike and neither possesses a pale wing bar—this in itself seems unusual within one genus (some sexually alike, others unlike). The bill is blackish with reddish areas on the sides.

In *Prosopeia splendens*, the bill is very much larger and of different shape. Although the sexes are alike, the males are larger generally and particularly in the head and bill, seldom can an error be made in choosing among live specimens.

Owing to the striking similarity of the general colour pattern between some species, the three genera have given rise to considerable confusion and consequent taxonomic revision so that it is far from an easy matter for anyone not well acquainted with these changes, clearly to distinguish them ; and reference to earlier authors may well increase the difficulty. Indeed, if some recent references to the large, sexually dimorphic, Eclectus (?) Parrots from the Solomon Islands, *Larius roratus solomonensis* (Rothschild and Hartert) (emended to *Lorius* in Peters), as the " King Parrot " are allowed to pass without comment the confusion is likely to increase.

To clarify this last point which is of minor consideration here, the name *Eclectus*, Wagler, was in constant use for this genus of parrots of such unique sexual dimorphism from 1832 until 1915, when Mathews discovered that Boddaert had used a prior title *Larius* (1783) which he emended to *Lorius*. Thus under the priority rule the well-established *Eclectus* was displaced much against the wishes of many scientists who had used the term for the whole of their lives. In spite of this, the name persists in common usage in many parts of the World to this day. To apply the common name of " King Parrot " to a species which was

named the Solomon Eclectus Parrot by its authors in 1901, is bound to lead to future confusion. Indeed, Ernst Mayr (*Birds of South-west Pacific*) used this name, which was followed by Cain and Galbraith (*Ibis* 1956, p. 129) and thus repetition adds to the trouble. Admittedly this name may be used by local residents or natives in a locality, but when another species has been accorded world-wide use of the same name for many years (in this case over one hundred), this improper appropriation of the same name is to be discouraged.

Reverting to the three genera under consideration, they are characterized by their large size, some 14 to 18 inches in overall length including the long, flat, wedgeshaped tail, of which the rectrices are not distinctly tapered distally, nor much graduated, and the tips are rather broad and rounded. (The Crimson-wings have a comparatively shorter tail.) Next, by their brilliant color patterns and general shape, in which respect the similarity between the Fijian and Moluccan species is particularly noticeable ; also the sexes in these races are alike whereas in the Kings of Australia and New Guinea the sexes differ.

Historical

Gould first established the genus *Aprosmictus* when he wrote to the Zoological Society in 1842, from Australia, saying that on closer acquaintance with the genus *Platycercus* he was of the opinion that two species, namely *erythropterus* (Crimson-wings) and *cyanopygius* (Kings) should be removed on account of differences in habits, colour pattern, and certain anatomical and morphological differences, enumerated in his letter which was read at the Society's Proceedings. Some years later, in 1865, when writing his *Handbook to the Birds of Australia*, Gould realized on reflection that Crimson-wings and Kings also required to be separated since their colour patterns were quite different ; their tails too, had different formulae. He may have also recalled writing elsewhere, how he had watched flocks of Crimson-wings feeding, and what a wonderful spectacle they made, " especially when there were a number of adult males in the flock, when their crimson shoulders stood out against all surrounding objects." Now this does not agree as a fair description of a species named " *aprosmictus* " which literally means " one who does not mix "—" a solitary individual normally ". So he decided to remove the more sociable Crimson-wing to a new genus which he called *Ptistes*, under which title they appear in the B.M. Catalogue.

Having named two species as co-types of *Aprosmictus* in 1842 Gould simply removed *erythropterus* to be the type of his new genus, and left *cyanopygius* behind as the type for the less " Non-mixing " genus. In my view Gould did this deliberately and knew quite well what he was doing. Quite incidentally, the name *cyanopygius* was subsequently revised to *scapularis*. A modern analogy might be to say that there

had been two "joint managing directors"; one retired to take up a new post, leaving the other in charge.

Gould was not to know that during his absence, Gray had been working in England incessantly to produce a better classification of birds and had published several works on the subject, in one or more of which, he had listed the genus *Aprosmictus* bracketing thereafter *erythropterus* as the type. Either Gray did not notice that Gould had named two types, or he attached no significance to the fact. Quite possibly at that time there was no rule to give significance thereto.

In 1911 Mathews discovered what he called "Gould's blunder", and by that time there was a rule. The question is, how could Gould have complied with rules of which he was not aware, and which had probably not been made at that time, possibly not until some years after his death. Be that as it may, Mathews cancelled *Ptistes*, as invalid, removed the name *Aprosmictus* from the Kings (*cyanopygius* = *scapularis*) where it had been in use for seventy years since 1842, and transferred it to the Crimson-wings (*erythropterus*) because he contended that Gray had so designated the type, simply by adding it in parentheses after the generic name. Although careful search was made in several of Gray's works on genera and species, no definite statement could be found anywhere to the effect that "I hereby subsequently designate . . . as the type" or "I hereby restrict . . . as the type". Thus the Kings, *scapularis*, became nameless, so Mathews named them "*Alisterus*" in honour of his own son. He named *scapularis* as the type and listed the species which the genus embraced, the Australian Kings (*scapularis*), the Green-wing Kings of New Guinea (*chloropterus*), and the "Island" Kings (*amboinensis*), of which further sub-species have since been discovered.

Not unnaturally many ornithologists who had been referring to these birds for over seventy years by their former title did not approve of the change, and some even refused to recognize the new proposals. This appeared to annoy Mathews intensely, and he wrote to *Ibis* (April, 1916) accusing Ogilvie-Grant, and others who shared his view, of personal bias. In 1917 Mathews in his excellent work, *Birds of Australia*, Vol. VI, repeated all this taxonomic wrangle, again listing all the Kings covered by *Alisterus* which in fact, comprised all the Australian, New Guinea, and Moluccan species then known, adding :— "All the preceding generally agree in size and coloration, and have the same wing formula and bill structure, and their range is East Australia and the Moluccas and New Guinea. It should be noted that as far as we know them, the females are quite different in coloration, having the head and neck green, and other differences . . . ". He then proceeded to point out how the Fijian genus differed from all these, in that the sexes were alike, and other differences of characters.

In this observation, even Mathews was at fault, since the "Island"

Kings do not differ in colour pattern between the sexes. This fact, coupled with the similarity of colour pattern, led me to the conclusion as many early writers had believed, that *Alisterus amboinensis* and *Prosopeia splendens* (later regarded as a subspecies of *tabuensis*) were very close to each other, and eventually led to many subsequent discussions with the late Duke of Bedford, who as most aviculturists know, was ever ready to assist anyone with psittacine problems. He had considerable experience with both genera in captivity, and therefore I am pleased to be able to quote from his writings which he amplified to me in discussions in days gone by, in the hope that this may help others to distinguish between these three genera, which are dealt with in turn as follows :—

1. Genus *Aprosmictus* (in Peters) *The Crimson-wings*

Only two species are recognized though these have been separated further into local races or subspecies. Obviously they are closely related to the Kings or Gould would never have regarded them as of the same genus, nevertheless, as anyone who has kept both for some time will agree, each has peculiarities of habit. Races of Australian birds, *erythropterus*, have been separated on the characteristic of size alone, and the New Guinea race is very similar ; only differing in the smaller size and having less black on the back in the males. Sexes are different as the females do not have black backs though there is some red in the wing ; immatures all resemble the adult female, full adult plumage not being attained until they are over two years old, therefore the selection of true pairs from young birds is not possible.

The second species, *jonquillaceus*, is found in the islands of Timor and Wetar, the sexes are more difficult to distinguish at any age as the males have no black on the back, females only differing from them by the amount of blue present on the upper wing ; even this appears to vary individually so that some females are quite distinctly marked with blue whilst others are almost lacking, and in the males the colour is more pronounced in some than others. Certainly one specimen examined was labelled as a female, but looked blue enough to be a male. The late Duke rated these birds very poorly in his estimation:—

" For many years I longed to possess the Timor Crimson-wing (*Ptistes jonquillaceus*) [the old generic name], but when my ambition was at length realized I found that the whole order of Parrots does not contain a more ill-conditioned brute, nor one more tiresome from the avicultural standpoint—not only does he pluck himself with more frequency and persistence and less excuse than any other psittacine bird, but he kills his wife as a matter of habit, and, if he should be tame (?), he hates the human race—and especially his owner—with an intensity that must be seen in order to be believed ! " (Bedford, AVICULTURAL MAGAZINE, 1950, p. 100).

The interesting point about this genus is that there are two species, one of which inhabits mainland regions and the sexes are different; whilst the other is of insular origin and the sexes are difficult to distinguish. Both are admittedly "wife-beaters", but the island race appears even more evil-tempered in this direction than the mainland bird. A parallel will be mentioned later.

Before leaving this genus, mention should be made of a very beautiful bird which was illustrated in Gould's *Birds of New Guinea* as *Aprosmictus insignissimus*. This was mentioned by Peters (p. 250) who noted that it was now considered to be a natural hybrid between *Alisterus s. scapularis* × *Aprosmictus e. erythropterus*. On reference to Prestwich's *Records*, p. 179, it transpires that this cross has been produced on at least two occasions in captivity, and the brief description by Jean Delacour of a male of a pair he saw agrees well with the illustration in Gould mentioned above. Thus might aviculture confirm such doubtful matters and prove the close affinity of the two genera beyond dispute.

2. Genus *Alisterus* (in Peters) which comprises three species :—

(*a*) *scapularis*, the Australian Kings.

(*b*) *chloropterus*, the New Guinea Green-wing Kings.

(*c*) *amboinensis*, the "Island" Kings of Northern New Guinea, the Moluccas and Celebes.

(*a*) *scapularis*. The Australian Kings are well known to many aviculturists, the males being magnificent, showy birds with the head and most of the underparts bright scarlet; the wings and mantle dark green with a touch of blue where the green of the mantle and the red of the head meet, and with a longitudinal light green stripe on the upper wing-coverts; the tail very long, broad, and flat and considerably larger than in the Crimson-wing. The female is much more soberly clad, being mainly dark green without blue on the hind neck; a reddish wash on the greenish underparts; the green wing-stripe is usually absent, though I have bred some hens in which this has developed to a certain degree. I also possessed one hen with a distinct red fleck on one side of her head. She lived for many years in my aviaries and eventually laid eggs so I had no doubt about her maturity or sex.

Only two races were recognized by Peters, though more have been proposed, but most probably did not prove to be sufficiently constant in variation to merit racial distinction. These differences referred to size rather than colour. Immature birds resemble the adult female but young males soon begin to acquire some reddish tinge to the upper mandible whilst the females' remain dark, though some adult females sometimes show a little orange on the base of the mandible, but

not enough to be confused with the really orange-red bill of the adult male. It takes at least two years for adult plumage to be assumed. Occasionally a young male shows considerable flecks of red in the parts that will eventually become entirely so in his first moult. But the number of aviculturists who have acquired a supposed pair of Kings only to find that they had an adult and an immature male will confirm that young birds are impossible to sex.

(*b*) *chloropterus*. The New Guinea Green-wing Kings are very close to the Australian species, the males, if anything, being even more handsome. As so often happens among psittacines in the tropics the more northerly population are somewhat brighter in colour and slightly less in size.

The red of the Green-wing King is darker ; there is much more blue on the nape ; the characteristic wing-stripe is broader and a much paler apple green. Again, the females are duller than the males and immatures resemble the females. However, these Kings inhabit the lower slopes of the mountain ranges of New Guinea and are frequently separated by physical barriers from neighbouring races. This appears to have resulted in the naming of several sub-species, some of which are scarcely tenable, since differences are attributed to one sex only in some cases, whereas elsewhere another subspecies has been nominated for a slight difference in the opposite sex. When it is realized that the species takes three years to acquire full adult plumage, it is obvious that individual variation is bound to occur which collectors, in their eagerness to discover new races, might well imagine a greater variation in their specimens than did in fact exist. More recent authors, such as Peters and Mayr have synonymized some of these races.

Females of *chloropterus* and *scapularis* can be distinguished from each other by the smaller size of the former, which also have a deeper blue rump ; darker reddish wash on the underparts, and the under tail-coverts are blue basally with red edges as compared with those of *scapularis* which are green basally with red edges. These differences are not nearly so easy to observe in a living specimen as their enumeration on paper would suggest.

Some years ago I reared a number of hybrid *Alisterus c. chloropterus* × *Alisterus scapularis* but only retained one male specimen until it attained full adult plumage when three years of age. This bird was almost indistinguishable from its male parent. The *chloropterus* nominate race is clearly distinguishable by the " lozenge-shaped " patch of blue on the nape and hind head (see sketch).

(*c*) *amboinensis*. The " Island Kings " have a similar colour pattern to others of the genus *Alisterus* with two important differences. The colours are generally much darker in hue on average ; and there is no near vertical, light wing-stripe. Moreover, females and immatures

are almost identical with the males—quite unlike the Australian or other New Guinea species.

Various sub-species are recognized as populations of different islands, which only differ from each other in size or slight coloration to some degree. In one subspecies, *hypophonius* from Halmahera, green is lacking in the plumage, being replaced by blue, and the crimson underparts are also purplish washed.

The really interesting points are that instead of the sexes differing—as Mathews appeared to believe—they are alike in colour pattern. Secondly, these " Island " species are less even-tempered than other *Alisterus*—a characteristic of singular significance in the view of the late Duke of Bedford who frequently discussed this matter with me. He drew an interesting analogy between the two genera *Aprosmictus*, Crimson-wings, and *Alisterus*, Kings, emphasizing that each included one species of mainland location in which the sexes were dimorphic yet tolerably well disposed towards each other ; as opposed to which, each genus contained a species in which the sexes were alike and extremely bad tempered, both being of insular location. This is supported by the following avicultural observations :—

" Between the species of *Alisterus* in which the sexes are alike and those in which they differ in appearance there are fairly marked points of resemblance and also fairly marked points of distinction. In voice the former group are definite Kings, but in temperament both sexes are fierce birds, addicted to murder, which the Australian King is not."

" The climate of the East seems, indeed, to have a bad effect on the manners of the Parrakeets of the Australasian group " (Bedford, AVICULTURAL MAGAZINE, 1950, p. 99).

A female Salwatty King, *A. a. dorsalis*, lived in my own aviaries for a number of years. Being unable to procure a mate of her own species, she was provided successively with two Australian Kings, *scapularis*, as mates. In spite of her smaller size, she eventually killed both of these. Thereafter she was given a cock Pennant, *Platycercus splendens*, with whom mating was observed and she went to nest and laid eggs which were not fertile, though she sat well. This confirmed the explanation offered by the Duke, that male Kings, accustomed to a quietly garbed, respectable looking female, failed to recognize this " over-dressed " specimen as a suitable partner at all. So enraged was the hen at this affront to her sex, that she never forgave them, and thereafter refused to have anything to do with them.

Nevertheless, the Duke did succeed in crossing a Crimson-wing male, *Aprosmictus erythropterus*, with a female of the small Sula Island race, *Alisterus amboinensis sulaensis* (see Prestwich, *Records*, p. 170 ; also Tavistock, *Parrot-like Birds*, p. 248). Although these hybrids were never proved fertile, it was fairly evident that both sexes were reared.

Both sexes had red patches in their green areas when immature, and took three years to assume full adult plumage.

"A three-year-old ... hybrid ... is now moulting into adult plumage and is showing a quantity of light yellow-green feathers on each wing. It is curious that by crossing a Parrakeet with a red wing-bar with one with no wing-bar at all you should produce offspring with a pale yellow-green wing-bar rather like that of the other species of Kings. The wing of a Sula Island of either sex is uniform dark green" (Tavistock, AVICULTURAL MAGAZINE, 1929, p. 256).

This only emphasizes the absolute unpredictability of hybridizing, and raises another interesting point. A species cannot be persuaded to hybridize within its own genus, yet does so with a species of another closely related genus and succeeds in producing progeny. Neither should it be forgotten that *Aprosmictus insignissimus* of Gould's work previously referred to, is now believed to be a cross between members of these two genera.

Before leaving *Alisterus* reference must be made to the excellent review of the genus by Prof. O. Neumann in 1926. He took the view that they were all of one species, or "Formengruppen" which he designated *amboinensis*, and listed all the races as subspecies thereof. He gave very useful "keys" as aids to identification, and pointed out one distinctive feature, namely that immature specimens had a tail characteristic, the rectrices were pointed at the tips with pinkish edgings, whilst in adults that had moulted out, the tips were then rounded and the pinkish edges lacking. This would enable museum specimens to be more readily identified and give some indication of the age of a specimen. However, so far as I know, this species has only been bred in captivity once, in 1940, when no observations were recorded. Certainly this does not apply to the Australian species, for I can well remember how difficult it was to remove well-grown young birds at the end of the season, one had to be very careful not to take out the adult breeding hen in error, and it was quite impossible to distinguish them with certainty.

Neither Peters nor Mayr accepted the view that *Alisterus* were so closely allied as to be of one species, and regard them as of three specific forms, which avicultural experiences certainly support and may even suggest that the division between the Australian and New Guinea "mainland" species on the one part and the "Island" (*amboinensis*) on the other part is even greater.

3. Genus *Prosopeia* The Shining Parrakeets

Many instances could be cited to illustrate how the similarity of colour pattern and general shape between this genus and *Alisterus amboinensis*, the Island Kings, has led to the almost involuntary association of the two as close allies. Even Latham is reputed to have

regarded them as representatives of the same species. It therefore remains to indicate their points of difference.

Prosopeia are generally much larger in size, especially in the bill, which is deeper, blacker, and rougher on the surface. Although the sexes have the same colour pattern, they differ in size, the males being larger particularly in respect to the head and bill. Their colour too, is darker, even in the *splendens* subspecies, the other races of *tabuensis* being almost wine coloured. The green in all of them although of equal " tone " is much more glittering in character ; they are noticeably darker around the lores and face ; the wing formula is slightly different.

For more practical comparison of habits and temperament, let us consider once more some of the observations of the late Duke of Bedford who had several specimens in his collection at different times :—

1. " On account of a certain superficial resemblance in their colour scheme they have been classed with the King Parrakeets and even—Heaven knows why—with the Broadtails. As a matter of fact they have nothing in common with either and are totally different in character and habits. Not much seems to be known of their nesting, but two eggs appear to be laid in a hollow tree and the sitting hen is fed by her mate " (Tavistock, *Parrots and Parrot-like Birds*, p. 186).

Casey Wood (Emu, 1923) recorded three eggs in the nests he found.

2. " I do not think that, beyond the fact that they both belong to the same order of birds and have a certain superficial resemblance in form and colour, there is the least affinity between the members of the subgenera *Alisterus* and *Pyrrhulopsis* [= *Prosopeia*]. Having kept both, I can say with confidence that it is difficult to find two groups of Parrakeets more utterly unlike in every respect " (Bedford, AVICULTURAL MAGAZINE, 1950, p. 99).

3. " Old writers, misled by a certain superficial resemblance in form and color arrangement, imagined that they were nearly related to the Kings (*Aprosmicti*) [= *Alisterus*], but as a matter of fact they are sharply differentiated from the latter by their larger bills ; the peculiar silky texture of the green areas of their plumage, their musky odor, and by nearly all their manners and habits. They form, indeed, a small and very distinct genus confined to the Islands of the Fiji group. There are five species or subspecies, but of these only two are strikingly distinct."

" The sexes are much alike, the female differing in the smaller size of the head and beak ; and the young also appear to resemble the adults to a considerable degree save that their bills, instead of being black, show a considerable amount of whitish horn colour " (Tavistock, AVICULTURE (U.S.A.), 1931, p. 297).

Bahr (*Ibis*, 1912) remarked that the eye of nestlings was brown, that of the adults orange to yellowish, but not a sexual distinction.

When an attempt at hybridizing the two genera was made in the Duke's aviaries, although the birds appeared to tolerate each other, the eggs were infertile.

Thus it is fairly conclusively shown that there should be no difficulty in distinguishing any of these birds, in spite of external similarities. And the affinities between the two are not close at all, and even the geographical break occurring between them seems to emphasize this fact.

The accompanying sketches may make the points of difference easier to appreciate, although it is difficult to express difference in colour values in black and white.

* * *

BREEDING OF THE BROWN MANNIKIN

Lonchura fuscata

By A. MARTIN (Stockport, England)

A pair of Brown Mannikins came into my possession in February, 1960. They had been imported by the late Mr. W. J. C. Frost in 1958. I had only once before seen this species, in 1928 when I was acting as Curator to the late Mr. G. H. Gurney, who then informed me that the pair in his collection were Cinnamon Tuxas. I have been unable to ascertain the origin of this name but assume it to be the native name in Timor.

I kept them in my bird-room until mid-May when I turned them out into my aviary. They quickly settled down and did not appear to mind the few other birds—two pairs of Budgerigars, a pair of Golden-breasted Buntings, and a Red-headed Finch.

By the end of May they were busy carrying dried grass and making a nest in an old Budgerigar nest-box. The first egg was laid on 1st June. Both birds seemed to take it in turns to occupy the nest-box. I did not interfere with them in any way, but after they had been sitting for about eighteen days I examined the box and found four eggs, all of which were infertile. As perhaps one might expect they were pure white, rather elongate. I cleaned out the box and the Mannikins were very soon busy carrying in a variety of material, pieces of paper, small feathers, but mostly hay and moss. The hen disappeared inside but this time it would have been quite impossible to see what was going on, the box was so crammed with nesting material. I again left them quite alone. I particularly noticed that both birds took turns in the incubation which I would estimate to be about sixteen days. Both birds then started visiting the box very regularly. I supplied plenty of

live food but it was never touched ; large quantities of green food were eaten, particularly chickweed, and seeding grasses.

At the end of August one young one left the nest. It put one in mind of a young British Bullfinch. A second left the nest a few days later, but it appeared to be rather weakly and died after two or three days. The first is a fine, strong bird and is now quite as large as its parents.

As this species will be unfamiliar to the majority of our members it may not be out of place to give a brief description of it.

It is light chocolate-brown above ; blackish on the crown ; cheeks and ear-coverts white ; throat black ; breast light brown and separated from the white belly by a band of black ; tail blackish ; beak leaden. The sexes are alike in plumage, and the size is slightly less than that of a Java Sparrow.

As described above, A. Martin has bred the Brown Mannikin *Lonchura fuscata*. It is believed that this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

RAIN-BATHING

By C. J. O. Harrison (Tooting, London, England)

One of the rewards of aviculture is the insight that it gives into the habits and behaviour of birds, much of which might rarely, or never, be seen in the wild. It was through watching captive and feral birds that I became aware of the occurrence of rain-bathing, about which little seems to have been recorded.

I was very impressed by the first view that I had of it, although it must be familiar to many people. It occurred in a flock of feral pigeons (*Columba livia*) which were resting on a dry day in summer when a sudden shower of rain fell. Instead of seeking shelter most of the birds squatted down and lay on one side with a wing extended vertically above them, the posture being apparently the same as that used in sunbathing. The birds appeared to be responding to a sensual stimulus by exposing to that stimulus a greater surface area of the body than would be affected were their posture normal. Since shelter was available, but not used, one may suspect that they derived satisfaction from this behaviour ; and since water was available, and since pigeons are capable of bathing in the typical fashion, the posture was not necessary in order for bathing to take place.

I was familiar with the typical bathing that most birds indulge in, with its squatting, head-ducking, and wing-fluttering ; and with the posture of a bird out of cover in heavy rain, moving with wings partly drooped and shaken a little at intervals to shed the accumulated water ; but I had not previously witnessed the use of a special posture for deliberate rain-bathing.

I have since seen this behaviour a number of times but, up till now, only from feral pigeons and not from other doves.

I next saw rain-bathing, in this sense of deliberate exposure of the body and plumage to rain, by a pair of Blue-winged Parrotlets (*Forpus passerinus*) in an outdoor aviary. Again, shelter that they were accustomed to use was nearby. As the rain began they called noisily and, bowing the head down low near the perch, they spread their wings horizontally to their full extent and, with tail spread, but a little lowered, moved clumsily about the perch in this posture for several minutes. On another occasion the cock took up this posture while clinging, head downwards, to the wire side of the aviary. In this position the vivid blue of wings and rump were fully displayed and he looked like some gorgeous butterfly.

I saw this posture again in a flock of Cockatiels (*Nymphicus hollandicus*) in an aviary at Whipsnade Zoo. After a prolonged dry summer my visit coincided with the first rain for weeks. As it started to rain there was the same outburst of noisy calling that I had heard in the case of the parrotlets, and bird after bird lowered its head and spread its wings and tail in the fashion already described, the white wing-patches suddenly flashing into view.

The only published description and photographs that I have discovered as yet are in Dr. Maurice Burton's book *Phoenix re-born*. He gives a photograph of an African Grey Parrot (*Psittacus erithacus*) in this posture, but from the movements of the head and partial spreading of the tail describes it as " anting without ants ", although there is no evidence that a parrot will adopt such a posture when ants are present. He also quotes a description of a parrot adopting this posture " . . . when sprayed with warm water on the breast and wings ". This bird, an Amazon, was described as having brought its wings forward until the tips of the first primaries were pressed together when fully displaying this posture.

I was uncertain whether parrots might not use this posture for sun-bathing, although I had never seen one do so. I discussed this with Mr. E. N. T. Vane who was able to tell me, from his very extensive knowledge of the parrots, that rain-bathing occurred widely among the parrots and that many species would hang head downwards when doing so. He confirmed my suspicion that sunbathing is seldom seen in parrots, which seem to spend more time avoiding direct sunlight ; but when he had seen it on various occasions from a number of species

it had occurred on the ground, the bird lying over to one side and extending only one wing at a time, fully spread, either to one side or up above the body.

From this it would appear that rain-bathing parrots use a special posture which differs from that used when sunbathing. Some species, such as the Budgerigar (*Melopsittacus undulatus*), which normally inhabit grassland, bathe by rolling in wet grass. As far as I know these species do not indulge in rain-bathing of the type described. The recognition of wet vegetation as a bathing medium appears to be innate. A friend had a Budgerigar which had been caged from its youth, but which was allowed to fly around in the house. He could not persuade it to bath in water but one day when some watercress was being washed the bird descended and proceeded to wallow in it, and subsequently behaved in the same fashion whenever green, leafy vegetables were washed.

From the evidence available so far it would appear that only pigeons and parrots possess these special rain-bathing postures. I find it hard to suggest a reason for this and I would not be surprised to find that the habit is more widespread but has passed unrecorded. If anyone has observed special rain-bathing habits in other families I would be most interested to hear of it.

REFERENCE

BURTON, M. (1959). *Phoenix re-born*. London.

Since I wrote these notes Mr. K. E. L. Simmons has kindly drawn my attention to a statement in *Bird Behaviour*, by Frank Finn, that "Larks . . . bathe in the rain, lying down in it with outspread wings, . . ."; which suggests that it might occur elsewhere among the passerines.

It is a pity that we do not know which species of Lark, in what country, and under what circumstances it occurred.

* * *

BREEDING OF THE YELLOW-WINGED SUGAR BIRD

(*Cyanerpes cyanerpes*)

By Dr. HENRY QUINQUE (Paris, France)

For some years I have always kept those wonderful birds, the nectar feeders, in my aviaries. Their metallic reflections, incomparable allure, and liveliness have always attracted me.

To begin with I kept a dozen Sunbirds together with a pair of Yellow-winged Sugar Birds in an aviary in my salon. Believing them to be extremely sensitive to cold, I overheated my flat for their benefit. This experience revealed a number of mistakes—the fights were incessant and often bloody ; the resplendent red of some of the Sunbirds turned to a dull yellow after the first moult—in fact, I was keeping these birds under very bad conditions, which I afterwards changed completely.

In spite of the many mistakes I made to begin with it was in my salon in Paris in an aviary (measuring 1 m 80 in height, 1 m 50 wide, and 0 m 80 deep) containing twelve Sunbirds and a pair of Yellow-winged Sugar Birds that I had my first thrilling experience.

During the third week of May, 1956, the female Yellow-winged Sugar Bird began to be very interested in a laurel in a pot in the corner of the aviary. She examined the various branches minutely in search of the one which would be most suitable for her future activities. During this time the male was aggressive to all the Sunbirds which wished to perch in the laurel and did not hesitate to chase off birds much larger than itself. Some days later the female carried about blades of dried grass which she did not place in the shrub but rapidly dropped them. Then on 28th May, she really began the construction of a nest on the level part of the fork of a branch. On the following day I removed all the Sunbirds from the aviary in order to leave it entirely for the Yellow-winged Sugar Birds.

In spite of this disturbance the female did not stop the work she had started ; for five days she carried pieces of ravelled-out hemp, cut into lengths of 8 or 10 cm., coconut fibres, and blades of green grass which had been provided for her. The result was a wonderful nest made in the shape of a cup, entirely lined with hemp with a few white feathers woven in. The cup measured 8 cm. in diameter inside, but was very deep and conical so when the female was on the nest she disappeared entirely from view except for her beak and tail which were raised obliquely upwards. The male took no part whatever in the building of the nest, but he followed the female about wherever she went. On several occasions he made the courtship display, but I did not observe

any copulation while the nest was being built. When the female had finished and shaped the nest by lateral movements of the body she laid two eggs. The eggs were laid on the 3rd and 4th June in the morning ; they were globular, sky-blue in colour with tobacco brown spots, which were more dense at each end. For twenty days I refrained from going into the aviary to look at the nest, but when I did so I was most disappointed to find only one egg which was perforated at the side.

A few days after I had taken away the perforated egg the female laid two further eggs from which two perfect youngsters were hatched. Unfortunately the day after they were hatched I found them on the sand of the aviary. After having put them back three times, I had to pick them up again three times from the ground, where they had obviously been thrown out by the female. I realised that it was useless to persist as the male was frequently making the courtship display and the female evidently wished to lay again. I therefore took the tiny birds and put them in an artificial nest inside a heated box. I succeeded in feeding them with crushed drosophila and syrup by means of a pipette, but they died at the end of the third day.

Two weeks later I saw several matings and the female laid two more eggs. Two young birds hatched out, but their development was relatively slow though they were fed perfectly by the female for fifteen days when she suddenly stopped taking them any food, although I had taken the precaution of putting a large number of drosophila into the aviary which was entirely covered with fine meshed material.

Shortly after the death of these two young birds (which I have preserved in spirit) the female laid a single egg. This hatched into a magnificent young bird which developed rapidly, but was also abandoned on the fifteenth day when it was almost completely feathered. The summer over the male began to assume its eclipse plumage (the date of which varies considerably in each individual) and things remained as they were for this season.

After this year, 1956, full of hopes and disappointments, I moved all the birds which I kept in my flat to my large aviaries with heated shelters which are situated in the centre of France. In 1957, in spite of much more favourable conditions the same pair did not make a nest. In 1958 the male escaped from the aviary ; the following year I procured a male, but the female died.

It was in 1960—thanks to a new pair which I bought at the beginning of the year—that I had the very great pleasure of success. I bought a female on the banks of the Seine on a very cold morning in January, though I made this acquisition without much hope of being able to save it, for I took home a ball of feathers chilled with cold and put it in a cage in my flat. By March it was a magnificent female and I took her to the country where a male resplendent in health and beauty was waiting for her. My aviaries are situated a few kilometers from Limoges

in the centre of France ; unfortunately the climate is continental, it rains a great deal and in winter the temperature oftens drops to 15° Centigrade. At the other extreme, the summers are very hot and interrupted by violent and frequent thunderstorms. For this reason I have had the shelters made with double walls with glass wool in between. These shelters are heated by thermostatically controlled electric radiators and open on to a wired flight, 10 m. long by 2 m. 50 wide and the same in height, for each compartment. I put the pair of Sugar Birds, in company with two pairs of Dufresne's Waxbill and eight Red-headed Parrot Finches, in one of these compartments which was planted with bushes in the outside flight.

At the beginning of May I again observed the courtship display of the Yellow-winged Sugar Birds ; the two birds perch side by side on the same branch, stand up stiffly to the fullest extent, throw back the head, holding the beak half open, and raise the tail vertically. They then both utter a stiffled, sharp, trilling note which is more like the noise of a cricket than a song. I have often noticed the same attitude when a Yellow-winged Sugar Bird threatens another bird near it.

On 20th May, 1960, the female began to construct a nest in the shelter. Disregarding all the bushes planted in the outside flight and the boxes placed inside, she carried the material to the branches of bamboo placed inside the shelter. Whilst the nest constructed in Paris by the first pair was a work of art, this one was shapeless and careless, consisting only of a heap of dried grass scarcely hollowed out in the centre ; it was placed in full view on a few small branches of dried bamboo. After three days (23rd May) the female laid an egg followed by a second the next day. The eggs were identical in every way to the preceding ones, in number (never more than two), in the coloration of azure blue, and in size (being about one and a half times the size of the egg of a Gouldian Finch, but much more stubby and globular).

The two young hatched fourteen days after the laying of the first egg. One of them fell on the cement floor and was killed, but the second succeeded in remaining, for better or worse, in its uncomfortable nest. Like those which I had already had the opportunity of seeing, it had some downy feathers, blackish in colour, and very fine, especially on the head. A few days later the body was entirely covered in really black down, which is contrary to what I have read on the subject. The beak is as short as that of a seed-eater, but very wide at the base and very pointed at the tip and there is a bluish-grey membrane at the corners.

The food was brought by the female only and during the first eight days consisted entirely of soft insects caught in the outside flight. Later the female frequently fetched fruits and nectar from the bottles placed for this purpose. The female pushed her beak right down the throat of the youngster to feed it. The male always remained near the nest

during this operation, but never took part in feeding the young (nor, for that matter, did he feed the female while she was brooding).

How the young bird managed to remain on the pile of grass which served as a nest in spite of the incessant passing of the Red-headed Parrot Finches remains one of the many mysteries of nature. By the third week its beak was already half as long as that of its parents, the plumage was grey-green with some touches of yellow and the legs were completely black. At this time the bird left the nest for its first flight ; the parents took great care of it, always perching each side of it and accompanying it wherever it went. The female continued to feed it for a month and in begging for food it assumed the display posture of the adults shivering the wings like all young birds. After it left the nest the male never gave the youngster any food, but he guarded it and mercilessly chased away the Red-headed Parrot Finches if they came near.

A month after its first flight the young Yellow-winged Sugar Bird fed itself, took nectar from the feeding bottles, and caught insects in flight with the same agility as its parents. As I write these lines this magnificent bird is six months old ; it is completely tame and allows one to come within 50 cm. of it. Sometimes it threatens its father, which is in partial eclipse plumage, adopting the same attitude as the adults. The colour of its plumage is grass-green much brighter than that of the female ; the underpart of the wings is bright yellow, but the outer surface of the remiges is black which is an almost certain distinctive characteristic of the male of this species. A final point worthy of note is that the legs are black, whereas those of the female are rose-coloured and the male red.

I think this breeding success should be an encouragement to all those who like to keep nectar feeding birds or who hope one day to do so. Actually, these birds have a false reputation for fragility and extreme delicacy for, as a matter of fact, all they need is a little warmth in winter, absolute cleanliness, and the necessary food.

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PYRENNEAN BIRD LIFE

By M. Ellis (London, England)

This is a short account of a visit in June, 1960, to the Pyrenees (French), the range of mountains separating the Iberian Peninsula from France.

The first day began with a fine view of a Black Kite (*Milvus migrans*) from the train travelling from Lourdes to Pierrefitte Nestalas. From here my two friends and myself set about walking to Gavarnie. On leaving the town the first birds to be seen were the familiar House Sparrows, Chaffinches, Greenfinches, Goldfinches, Blackbirds, Linnets, Skylarks, Corn Buntings, and a Spotted Flycatcher. A solitary Egyptian Vulture (*Neophron percnopterus*) flew over the road some distance ahead of us. Bullfinches, Blue Tits, Great Tits, Magpies, Jays, Carrion Crows, Sparrow Hawk, Green and Greater Spotted Woodpeckers were seen as we proceeded along the road. Often seen in the fast-flowing stream running parallel to the road was the Black-bellied Dipper (*Cinclus cinclus*), differing from the British bird, as its name implies, in the colour of its underparts which are black instead of chestnut.

Luz was the next town we passed through. Here the Red-backed Shrike was common, perching on a post, or in a low bush—one preening, was still wet from bathing. A number of the commoner passerines were to be found around the town, including Serins (*Serinus canarius*) and Chiffchaffs. Crag Martins (*Ptyonoprogne rupestris*) and Buzzards were now frequently to be seen along the road. High above a Golden Eagle and a Booted Eagle (*Hieraetus pennatus*) were soaring quite close to each other. The former were now to be seen at regular intervals high above the cliffs towering on either side of the road.

A large family of Grey Wagtails were amongst the birds inhabiting Gedre, the next town we passed through. The stretch of road leaving the town was rather dull and it was rapidly becoming dark. But we pressed on, and spent the night just outside Gavarnie.

We set off early the next morning and soon reached Gavarnie (4,500 feet). Lying at the foot of one of the most magnificent sights in Europe, the Cirque de Gavarnie. The town is very popular and visited by hundreds of tourists daily. A Peregrine Falcon was the only bird to be seen. Leaving the town, we soon saw Citril Finches (*Carduelis citrinella*), Serins, Yellowhammers, and Black Redstarts. Adding Tree Pipit, Mistle Thrush, and Jay, on the return journey. Soon we came upon what were to be our constant companions for the next few weeks, the Red-billed Chough (*Coracia pyrrhocorax*) and the Yellow-billed or Alpine Chough (*C. gracula*), as it is more commonly called. These wonderful birds were to be seen in mixed flocks performing their aerial displays and calling high above our heads;

higher up they were always to be seen feeding together on and around the snow. The White-throated form of the Black-eared Wheatear (*Oenanthe hispanica*) and the Alpine Accentor (*Prunella collaris*) were encountered before we stopped to eat at the beginning of the Gavarnie valley. While eating we had the good fortune to see a magnificent Griffon Vulture (*Gyps fulvus*) appear from the valley and circle with the fabulous Cirque in the background. The rest of the day was spent leisurely reaching the refuge in the centre of the valley, where we were going to stay.

Having had my sleep disturbed by the refuge's rodent occupants, I was up extra early the next morning, and at 6.20 a.m. one of my companions spotted a single Lammergeier or Bearded Vulture (*Gypaetus barbatus grandis*) circling high above the Port de Gavarnie (7,510 feet). An idea of its terrific size could be got by the way it dwarfed the Choughs, lower down, to pin-heads. Shortly afterwards it appeared again from a gap in the rock-face opposite the refuge. The combined effect of the early morning sun and the reflection off the snow displayed to great advantage its rich orange breast and underparts.

Later in the morning we made our way up towards the Port de Gavarnie ; the air constantly being filled with the aerial call of the Water Pipit (*Anthus spinoletta*). We no longer met the Black Redstart, so often seen flitting from stone to stone on the floor of the valley, with a bill full of insects for its hungry family. We were unable to reach the Port but managed to climb to a higher position, looking across it, and into Spain. Seeing only a Kestrel after our hard climb, we became rather dejected and began to prepare our mid-day meal. Little did we know that we were about to reach the climax of our trip. For before we could begin, not one or two, but three Lammergeiers appeared below us heading for the Port. Led by an immature bird, having a white head, but lacking the white markings on the back and wings, which the adult that followed had. A little farther behind came a young bird almost completely a uniform blackish-brown, lacking the white head, and the same rhythm in its wing-beats as the two leading birds.

This magnificent bird, found in the high mountain ranges of Southern Europe, Africa, and Asia, has become known for its unusual habits. Amongst them the practice of flying to a great height with a large bone from a carcass, and dropping it on to the rocks below in an attempt to break it and obtain the marrow.

Before we could settle down again, over our heads and into Spain flew six Pallid Swifts (*Apus pallidus*), differing from the Common Swift which we saw later over Gavarnie, in being slightly larger and paler, and having a large white chin.

Other birds seen in the valley were Black-eared Wheatear, including

several youngsters, House Martin, Griffon Vulture, Snow Finch (*Montifringilla nivalis*) on two occasions, a young cock Rock Thrush (*Monticola saxatilis*), mainly greyish with the rufous just appearing on its breast. Adults were often heard, but never seen, although this youngster and others seen were quite tame.

The Heas Valley was visited. Amongst the birds not found higher up were a pair of Common Sandpipers, a pair of Rock Buntings (*Emberiza cia*), and a cock Blackcap. Taking insects to a nest in a hole under a overhanging rock about 10 feet up and beside the road was a Black Redstart. But a thick mist came down and blotted out further study in the valley.

Hobby, Goshawk, a family of White Wagtails, and a Stonechat were seen on the return journey to Lourdes.

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DISINFECTION OF AVIARY SOILS

By J. G. SUTHARD (Long Beach, California, U.S.A.)

Until a recent visit by Mr. George A. Allen, Jr., Editor of the *Gazette*, I was not cognizant of the severity of the problem of soil disinfection in aviaries. We had tried various chemicals for soil disinfection and found the lime-sulfur method non-toxic and very effective. At Mr. Allen's request I wrote a short article on my experience with this method for the *Gazette*.

In this area we are confronted with infection from the common Sparrow (*Passer domesticus*), from snails, slugs, and earthworms which are hosts to numerous diseases. To combat infections of invertebrates, virus, and bacteria, one must resort to one of two methods: (1) Make the environment unsuitable for the pests or, (2) periodically treat the soil with chemicals. The problem in chemical treatment of the soil is that the chemicals which will destroy the wide range of pests are toxic to the birds. Too, any such chemicals used for disinfection must necessarily be short-lived otherwise their use would be dangerous to the birds. One alternative to the two general methods is heat sterilization of the soil. The use of a torch is hazardous and the use of a steam pan though effective is very cumbersome and expensive.

We have found that the lime-sulfur treatment of the soil as outlined below is both a disinfectant non-toxic to vertebrates, and a deterrant to micro-organisms, worms, snails, slugs, etc. The sulfur is also effective against all kinds of mites.

Lime-sulfur Method of Treatment

The application of the lime and sulfur is very simple. First, rake the aviary ground free of debris. Eight pounds of slaked lime [1] and

[1] Slaked lime, $Ca(OH)_2$—this hydrated calcium oxide is available in a fine powder from builders' supply houses.

four pounds of sulfur [1] are applied per hundred square feet. This should be spread as evenly as possible and the soil turned by spading. The area is made level by raking and two pounds of lime and two pounds of sulfur used as top dressing. This should be raked into the surface. The birds may be returned to the pen immediately. In the case of very tame birds the operation may be performed without removing them.

The above treatment of the soil should be adequate for six months. Periodically lime may be dusted under the roosts and around the water-pans or drippers to keep the soil from becoming sour. The sulfur is slowly oxidized to sulfur dioxide which is a powerful disinfectant and, in its elemental form, is a killer of mites of all kinds. We believe it is complete protection against leg mites.

In badly-infected soils unslaked or dehydrated lime [2] may be used as a heating agent as well as a disinfectant. To apply, trench the aviary with furrows about 6 inches deep and 12 inches apart. Place in these furrows unslaked lime (use gloves to handle), broken up into chunks about 2 inches in diameter. Fill the trenches with soil to cover the lime and soak the whole area with water. The heat generated by the hydration of the lime will kill all forms of life in the soil. The birds should not be returned to the aviary until it has completely cooled.

Where the onset of an infection is rapid and severe the use of strong chemical disinfectants may be necessary, so their use and the precautions therefor are discussed here in some detail.

Sodium Hypochlorite (Bleach)

Sodium hypochlorite is used generally in the form of 5 per cent aqueous solution for household purposes. It is available as a 30 per cent solution which is a strong oxidizing agent and should be diluted to about 10 per cent solution with water before use.

To apply, spray the soil, posts, baseboards, and perches until thoroughly wet. The birds should be removed from the pen before spraying. Spade the soil and spray again with the sodium hypochlorite solution and allow to stand for twenty-four hours.

Hydrogen Peroxide

This is an expensive chemical available in 3 per cent aqueous solution or as a 30 per cent solution. The latter should be diluted *carefully* (it will explode otherwise) by pouring the peroxide into water to

[1] Sulfur—any finely divided sulfur may be used, but the so-called "soil sulfur" is the least expensive. It is commonly used in agriculture to supply sulfur to soils deficient in this element.

[2] Unslaked lime, CaO—unslaked or dehydrated lime is available in chunks as taken from the kilns. It has a great affinity for water and this hydration generates heat. Gloves should be used in handling to prevent burning of the skin.

make a 5 per cent solution. The aviary, if small, can be thoroughly disinfected by spraying the ground, posts, wire, baseboards, and perches with the solution. As the oxygen is dissipated rapidly the birds can be returned shortly after the spraying is finished.

Chloride of Lime

This potent chemical can be used to disinfect the soil but has the disadvantage that soil will have to be allowed to stand for several days before re-use. The active agent, chlorine, is liberated slowly even when the soil is wet. The chlorine gas, being heavy, must be diluted by exposure to the air for a time.

Halogen Compounds (Compounds containing Chlorine, Bromine, or Iodine)

Most of the halogen compounds are too toxic to be useful for soil disinfection in aviaries. The use of a solution of potassium iodide—iodine solution—has been sold for this purpose but as the iodine sublimes at atmospheric temperatures, it presents a terrific corrosion problem with any metal surface such as the wire, etc. It is a powerful bactericide, but in addition to its corrosivity, is rather expensive to use.

The use of antibiotic dust could be justified in small enclosures, but again is very expensive.

The lime-sulfur treatment of the soil is the least expensive, least toxic, and most effective of any chemical treatment I have tried. Unfortunately the one type of infection which is difficult to guard against is virus. The most common is fowl pox which appears to be airborne, but resides in the soil for long periods. The use of lime appears to be effective in the destruction of this virus in the soil, particularly if the soil is kept moist. It is believed that the effective action of the lime is due to its alkalinity.

The lime sulfur method is consistent with some of the older methods such as wood ashes of which the effective agent was sodium or potassium carbonates and hydroxides.

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DISPLAY FROM A CAPTIVE COCK-OF-THE-ROCK

By C. J. O. HARRISON (Tooting, London, England)

Since 1955 the Small Bird House at the London Zoo has housed an Orange Cock-of-the-Rock (*Rupicola rupicola*). This lovely bird is almost wholly orange, even to the intense orange iris of its eye and although the flight feathers of the wings are black they are mostly concealed by elongated, tapering, whispy fringes that spread outwards from the edges of the feathers on the back, rump, upper tail-coverts, and secondaries.

I had seen this bird, a solitary cock, a number of times, but always crouching on the floor of its aviary enclosure in what appeared to be a semi-moribund condition. I had assumed it was ill and was puzzled that its condition seemed unchanged over a long period, but it was not until I recently visited the house on a day when few visitors were present and saw the bird perched in a normal posture, only to fly down and crouch as soon as it saw me, that I realised that it was almost constantly performing a display of some kind, directed at passers-by.

Very little is known of the behaviour and displays of these birds and I have only found one short first-hand account of their display in an article by W. Frost, in the AVICULTURAL MAGAZINE for 1910, where he describes their behaviour in their natural haunts. The chance to observe such behaviour is one of those unique opportunities that occur in aviculture and the information is worth recording.

In the presence of a human being, seemingly of any age or sex, the bird appears to pass into a trance-like state. This reaction is so instantaneous and so consistant that it is difficult to see the bird in its normal state, unless one can take it by surprise.

The bird's emotional state is most apparent from the appearance of the crest. Fig. 1 shows the crest in its normal, relaxed position. It arises on either side of the head in the region between the base of the bill and the eye, and spreads out to form a flat double fan of feathers which widens as it terminates on the crown of the head. The crest is orange, with a narrow, chestnut subterminal band bordering it.

When the bird begins to respond to a person's presence the crest is slowly expanded forwards and downwards, passing down on either side of the bill until it reaches the feathers of the throat. At the same time the head is tilted back a little and the large eyes gradually close to mere slits.

This expanding of the crest and closing of the eyes appear to be intimately linked. On one occasion I had the excited bird clinging to the wire in front of my head, facing me, with crest closed and eyes open. As I watched the crest began to expand and at the same moment

Fig. 1.

Fig. 2.

the eyelids began to close. This action was not complete, when the eyes began to open again and the crest began to contract. This was repeated several times, appearing to coincide with the onset and waning of impulses of excitement in the bird and I was able to witness the repeated incomplete spreading of the crest accompanied by partial closing of the eyes, the two movements occurring as though there were some mechanical link between them. In view of the position of the crest in relation to the eye it seems possible that some muscular relationship might exist. Fig. 2 shows a lateral view of the head with the crest erected, the head lowered onto the shoulders with bill tilted upwards and the eyes almost closed. This is the position adopted during display and although I have indicated the position of the tip of the bill, half-way up on the left-hand side of the crest, in life it is invisible to the casual eye.

The bird may begin to show this posture when perched, but invariably flies down to settle on the ground by the wire front of the enclosure, near the observer. The head is drawn down on the shoulders and the feathers of the neck and breast are fluffed out so that body and head appear to be a single rounded mass, the only break in the outline being the flat expanded crest which stands up above the body (Fig. 3). The wings and tail are hidden by the mass of feather fringes which sweep down like a trailing skirt at the back.

It crouches sideways on to the observer in a position which might be due to the physical arrangement of its surroundings, but which appears to be a deliberate lateral display. The head is always turned away so that the posterior edge of the crest is presented towards the observer. The crest is now fully spread and the eyes closed to mere slits. This posture is shown in Fig. 4. There sometimes appears to be a slight inflation of the neck and breast feathers, but otherwise the bird is motionless and appears to be in a trance-like state. Prodding from an inquisitive finger produces no reaction, but the bird is concious and watching. If the fingers of the hand are inserted through the wire and

pushed further and further forward in front of the bird, the head is turned further and further away, so that the posterior edge of the crest is always towards the foremost part of the fingers.

Fig. 3.

Fig. 4.

Although the bird normally crouches it may slowly rear itself up while maintaining the display posture. This might be due to the height and position of the observer and be an attempt by the bird to align itself in relationship to him.

In this crouching posture the bird's appearance does not suggest that of any normal creature. All that can be seen is a mass of fluffed orange feathers, from one end of which rises a flattened crest at right-angles to the main axis of the body. On the inner side of the crest, at its base, is the narrow slit of an eye, and there is another in a similar position on the outer side of it. There is no sign of a bill. One may frequently see baffled visitors trying to discover a recognisable avian structure within this mound of feathers. Normally the bird remains silent, but I heard an occasional faint cluck from it while it is posturing.

Fig. 5.

The bird may relax its posture, but when doing so maintains a crouching posture, the top of the crest no higher than the back and still expanded, and the eyes almost closed, as in Fig. 5. In this posture it may perform exaggerated hops, springing one or two feet vertically into the air and landing still crouching. If one moves to a new position in front of the cage the bird quickly relaxes its posture and flies to settle in front again. When doing so it may utter a loud squawking call and may fly directly at the head of the observer, clinging to the wire in front of him. There is a suggestion of aggressiveness in this behaviour.

Through the kindness of John Yealland, the Curator of Birds, I was able to visit the door at the rear of the cage through which it can be entered. I had hoped to see if the bird would react frontally to a person if no barrier was present. I found, however, that the bird did not react to the presence of a person at the door or inside the cage, but still persisted in flying down to posture at the front of the cage.

The keeper informed me that it postured to him in the same manner and was erratic in its behaviour, sometimes showing great tameness and permitting handling, and at other times flying at him in the apparently aggressive manner that I had observed when watching from the front of the cage.

The bird had been purchased from a native in South America in 1955. A surprising variety of birds and animals are reared by some native tribes and I suspect that this bird had been hand-reared and had acquired a total fixation on human beings. This view is reinforced

by the knowledge that the cock had been put with a hen at an earlier period, but had ignored her and continued to posture to passers-by.

So little is known that it is impossible to be sure whether the behaviour described represents an aspect of the elaborate communal display of this species, or whether it represents a response to another individual which under natural conditions might be a rival or a mate. There are elements of both aggressive and submissive responses in the behaviour described.

Frost, in the article which I have already mentioned, described a communal display in which one cock after another in rapid succession would fly down from a branch to settle on the ground and immediately turn and fly back to the perch, the whole forming a single rapid movement. The ground at such a spot was swept bare by the wings and tails of the displaying birds and the same spot was used repeatedly on different days.

The apparent attachment to one part of the cage shown by the captive cock and the fact that his behaviour resulted in this area being swept clear of sand, might be related to the behaviour described, but could be purely accidental.

If this behaviour is linked with the type of display-dance described by Frost, then we have a combination of the erection of specialised head-feathers and a display dance, or flight, between two points which is very reminiscent of the displays described for the Mannakins (Pipridae).

REFERENCE

FROST, W. The Cock of the Rock. *Aviculr. Mag.*, Ser. 3, Vol. 1 (1909–10), pp. 319–324.

* * *

CAGE AND AVIARY DESIGN

By JEAN DELACOUR (Director (retired) Department of History, Science, and Arts of the Los Angeles County, U.S.A.)

There has recently been a frightening outburst of bad taste in zoo designing ; fantastically shaped and coloured houses, cages, and aviaries have been erected here and there. Even worse ones are being planned. I was saddened recently at seeing the ugly and inadequate gibbon cage now being built at the London Zoo (on whose Council I served for many years) and still more so by the project of an aviary—a fussy, ridiculously shaped, " horned " horror which is not only in bad taste, but impracticable and unsuitable. The principle of a " walk-in " cage is excellent, and I can claim to be the sponsor of such aviaries in America, where they have proved highly satisfactory. But its very principle is that the cage itself is not obvious, so that the visitor who is inside has as much as possible the illusion of walking among free birds. The frame of the aviary must not only be simple and inconspicuous, but also made invisible by trees and creepers. Even its approach should be so planted on the outside that one is not aware that there is a cage at all.

As to colours, it might be appropriate to reproduce here a note I was recently asked to write for the *Journal of the American Institute of Park Executives* (Parks and Recreations, January, 1961, p. 19) :—

" In museums and zoos alike the use of bright colours should be made with extreme caution. A cardinal principle must never be forgotten : the exhibit itself, dead or alive, is the only object which should call the public's attention. Therefore, any flashy colours on the frame, container, cage, or fence are to be avoided. Those fixtures should be ignored or forgotten, and only discreet tones, which harmonize well with the neighbouring media, are adequate. All kinds of light fences and wire nettings are better painted black, a colour which makes them almost invisible.

Exceptions can be made only in the case of special installations, where an amusing and bright note is in order ; particularly in children's zoos, and in facilities such as restaurants, souvenir shops, stands, etc. There everyone's personal taste has a free range. It is essential, however, that brightly coloured facilities be screened from the main animal exhibits and do not compete with them. I favour, personally, some restraint in any case. In museums and zoos we do not try to sell common merchandise. Flashy colour schemes, which work well in purely commercial premises are out of place in such institutions. We show natural objects which have themselves a great attraction—they do not require outside help to call the visitor's attention."

* * *

NOTES FROM THE ORNAMENTAL PHEASANT TRUST

By PHILIP WAYRE

Birds in the Trust's collection have started the breeding season well. At the time of writing eggs have been laid by many of the rarer species of pheasants, including Temminck's Tragopan, Common Koklass, Himalayan Monal, Elliot's and Mikado. The Common Koklass laid seven eggs in her first clutch. This species has not been successfully bred in this country before, although Mr. F. E. B. Johnson succeeded in hatching chicks from his pair last year. Both the Trust's Cabot's Tragopan hens have laid, although unfortunately one bird had lost its mate a few days earlier.

Ten new permanent breeding pens, each measuring 20 by 9 yards, have been completed recently. Each pen contains a wooden house, purchased by the Director from the Leckford Pheasantries and presented to the Trust.

Recent arrivals include some Rock Partridge (*Alectoris graeca*) eggs from Cyprus, a pair of Painted Spurfowl (*Galloperdix lunulata*), and a number of Quail given to the Trust by Mr. R. D. Sane, one of our members in Bombay ; a pair of Grey or Red-necked Francolin (*Pternistis afer swynnertoni*) has been presented by Mr. Guthrie Hall, Penalonga Pheasantries, Southern Rhodesia.

On Saturday, 15th April, the Director gave the première of his film *Wind in the Reeds*, which is about the wildlife of the Norfolk Broads, at the Royal Festival Hall in aid of the Imperial Cancer Research Fund. An audience of nearly 3,000 resulted in several hundred pounds being raised for the Cancer Fund. A copy of the Ornamental Pheasant Trust's pamphlet was enclosed with every programme, and at the end of the show the Director explained the aims of the Trust and invited membership. Already a number of new members have joined.

Many visitors have been to see the collection this spring, and members are reminded that they are always welcome, but are requested to write or telephone beforehand. Arrangements will then be made to show them round.

* * *

OBITUARY

MONSIEUR A. DECOUX

One of the doyens of European aviculture, Monsieur Aimé Decoux, died in October, 1960, at the age of 72 at his country home Géry, at Aix-sur Vienne, near Limoges, France. Poor health and certain financial difficulties had compelled him to reduce his collection of live birds during the last two years, but until then he had kept some of the best series of parrakeets, doves, and small birds ever assembled. He had numerous aviaries and several bird rooms and many species were raised in them during the last fifty years. He kept rare birds of all kinds.

Monsieur Decoux was a scholar and wrote well in French, English, and German. The AVICULTURAL MAGAZINE as well as French and German journals contained many excellent studies of his birds A long and close friendship was formed between him and the writer and he was also a friend of our late Presidents, H. D. Astley and A. Ezra. We all exchanged pleasant visits, enjoying one another's birds and exchanging observations.

The passing of A. Decoux is a great loss to aviculture.

J. DELACOUR.

* * *

LONDON ZOO NOTES

By J. J. YEALLAND

Two specimens of the Kori Bustard (*Choriotis kori struthiunculus*) have been presented by Mr. J. O. D'eath who found them at a game farm in Tanganyika where they had been reared. This northern race had never before been in the collection and it is many years since the southern one, the Gom Paauw, as it is known in its native South Africa, was here. The males are said to weigh between 20 and 30 lb. and females only about 11 lb. It is a bird of the dry, open country feeding on small reptiles, various invertebrate life, especially locusts, vegetable matter such as seeds, and, it is said, small mammals. These two birds certainly like mice better than anything else.

Other arrivals of particular interest are an Imperial Parrot (*Amazona imperialis*), only found in the mountain forests of Dominica and now very rare, and a Blue-eyed Cockatoo (*Kakatoe galerita ophthalmica*) of New Britain and New Ireland.

A Red-legged Gannet (Red-footed Booby) chick was brought from the Cocos Islands and has grown well, being now able to fly. Two Humboldt's Penguins, four Golden Plovers, and a White-winged Parrakeet have also been received.

Two Yellow-backed Sunbirds (presented by Messrs. G. H. and J. R. Newmark and Mr. T. Dineen) have been released into the Tropical House. In this house there is a Pucheran's Emerald Humming Bird that was received in April, 1957.

Three Great Eagle-Owls and two Spotted Eagle-Owls have been bred in the Gardens. Spectacled Owls and Wood Owls nested, but the single egg in each case was not fertile, so eggs of Snowy Owl have been substituted for them. Last year the Wood Owls hatched and reared a Snowy Owl which, of course, soon became larger than its foster parents.

* * *

NEWS AND VIEWS

The breeding pair of Ospreys has returned to a nesting-tree at Loch Garten, Inverness-shire. The male arrived during the morning of 8th April, and the female the evening of the following day.

* * *

A recent count of wild Takahes indicates that this very rare bird is on the increase. Forty birds have been counted against twenty-six at the previous survey. It would certainly appear that the efforts of the Wildlife Division are proving successful.

* * *

Paul Schneider writes that it is his ambition to obtain a pair of Splendids. He says : " At present there are no breeding pairs in the United States. Bourkes and Elegants are quite plentiful and it is not uncommon to see flocks of twelve to twenty-five in various aviaries throughout Southern California."

* * *

An overseas member, with happy memories of a President's Garden Party at Foxwarren Park, enquires regarding the present ownership of our late President's former home. The property was purchased by Sapphire Films, Ltd., and it was in the grounds that the scenes for one of television's most successful juvenile series " Robin Hood " were shot. The film company has now gone into liquidation and Foxwarren Park is at present in the market.

* * *

Lloyd B. Thompson writes : " Mrs. J. Davidson who lives near here (North Burnaby, B.C.) last year reared two Roseate × Sulphur-crested Cockatoo hybrids. During the past three years she has reared nine or ten of this cross. When they leave the nest the young are grey with some yellow around the breast and neck and they have an amber crest. With each moult the body and wings become whiter. One young cock, a year and a half old, is about 50 per cent white on his back which is nicely marbled with grey and white."

* * *

The Wildlife Division of the Department of Internal Affairs has

succeeded in trapping four Kakapos in the Tutoko Valley, Fiordland National Park, South Island, New Zealand. The Minister of Internal Affairs, Mr. Gotz, has taken great personal interest in the project, which has been under the supervision of the Controller of Wildlife, Mr. J. D. Pascoe, with Mr. M. M. Small in charge of the search operations.

Every effort will be made to breed with these birds, which are in extreme danger of extinction. They are being maintained at the Mount Bruce Farm, Wairarapa, where Mr. Blwyn Welch has so successfully cared for the four captive Takahes. The Kakapo enclosure, which is both vermin and escape proof, is about 31 feet by 15 feet, and is divided into two so that the two pairs can be housed separately. In each enclosure two substantial underground rock caves, 2 feet by 1 foot 6 inches in height, have been made to simulate the holes under boulders where Kakapos spend the day in their natural habitat. At first there was some concern because the birds had reacted against the unavoidable handling, but they eventually settled down and are now eating apples, tomatoes, oats, bracken fern, and drinking honey in water.

We have just heard that one of the captive birds has died, but a fifth has been caught and they all seem to be doing well.

* * *

Charles Everitt sends a little advance news of the Edward Marshall Boehm aviaries. He writes : " Despite the late coming of spring, it is still very chilly and windy out here, we have started our breedings for 1961. The Wood Swallows have got two chicks, five weeks earlier than last year, and a Black-headed Sugarbird is on two eggs. We had another pair of Hoopoes go to nest, but, as with the pair last year, the hen died after having laid her third egg. This leaves us with but a solitary male so, until we get some more, we can go no further with those. I think we shall pull off some interesting ones this season, but it is too early yet to make any conjectures on the subject. Anyway, we have learned some rather useful things from our last year breedings. The yellow ring round the eye of the Magpie Tanager shows up at 8½ months old : Also they are sexable by the size of the white spots on the wings and the fact that the tail of the male is longer and broader than that of the female—rather a fine difference to pick out in an individual bird unless one has actually seen the variation. We have also detected a distinct sex indicator in the Occipital Blue Pies. The females have an iris of golden-yellow whereas that of the male is golden-brown. Further, the thighs of the female are greyer than the male's and the tail-feathers are not so long or as broad. These last two features would be hard to use as a guide, but the iris of the eye is a sure guide. I have not seen this recorded anywhere, so I thought it might be of interest."

A. A. P.

REVIEW

CAGE BIRDS. By R. M. Lockley. Pan Books, Ltd. London, 1961. Price 2*s*. 6*d*.

This book sets out to give the would-be bird-keeper comprehensive information as to how to go about his chosen hobby. There is a general introduction to the subject, followed by chapters on Canaries and Budgerigars and others in which all those species of foreign and British birds that the author considers most suitable for cage or aviary are briefly described, together with instructions as to their care in confinement. It is illustrated with numerous sketches of varying quality and four plates of photographs. One of these is titled " Chaffinch Mule " but appears to be a normal hen Chaffinch without the least sign of hybrid ancestry.

The book is, like the Curate's egg, quite good in parts.

The author makes some statements that are misleading and others that are entirely incorrect. For example ; that mealworms and gentles are an adequate alternative for wild insects (they certainly are not for most birds that feed their young on live food). That doves do not bathe in water but do bathe in dust (the reverse is true) and that their crop-milk is " semi-digested pap " (it isn't). That the nest-building of male weavers is " an occupational disease " and is comparable to the waltzing of waltzing mice (it is perfectly normal innate behaviour in no way comparable to the pathological waltzing of mice). We are told that bread and milk with beaten egg will serve as a substitute for insects for waxbills that are rearing young but not *how* to induce the waxbills to eat this substitute. It is not difficult to devise diets that are theoretically suitable for any particular bird, getting the bird to co-operate is a different matter and one all too often, as here, conveniently ignored by writers on bird feeding.

When it comes to general principles, however, the author's being primarily a student of birds in the wild state has its advantages. His advice on giving birds as much room as possible, allowing them to bathe when they like, giving parrots plenty of company (human if they are kept as house pets), and emphasising the dangers that may result from ringing nestlings are sound and humane and should do much to help beginners who read this book. Inevitably, however, the impression is given that bird keeping is rather easier than it usually is, at least so far as the keeping and breeding of most wild birds is concerned.

Printers' devils have had a field day with the spelling, or rather mis-spelling, of scientific names and on the vexed question of the relationships of the finches, weavers, and estrildines the author appears to disagree with most modern students of these groups. But these are minor points and, from the point of view of the aviculturist, there is

at least something to be said for considering all small seed-shelling birds as " finches ".

The author acknowledges the help he has received from the secretary of the Royal Society for the Protection of Birds and points out that he is on the Council of that body. Perhaps, therefore, this indicates that some leading bird protectionists now realise that it is as justifiable for persons of modest means to keep and study such birds as they can adequately care for as it is for some R.S.P.B. members to keep wild waterfowl. If such is the case the publication of this book is to be welcomed by all aviculturists, indeed by all fair-minded people, for more than its intrinsic merits.

D. G.

* * *

CORRESPONDENCE

TAWNY OWLS TAKING PARTRIDGES

I was surprised that no advice was offered in response to Mr. J. E. Harris's letter published in the January–February issue, but perhaps we all expected someone else to do it.

If Tawny Owls are killing the Partridges, the grass should be allowed to grow long and *Cotoneaster horizontalis* should be planted, thereby giving more cover. The ripe berries of *Cotoneaster horizontalis* are a favourite food of many birds.

Zoological Society of London,
Regent's Park, London, N.W. 1. J. J. Yealland.

SHOW CAGES OF BRITISH BIRDS AT THE NATIONAL SHOW

Perhaps you might be interested in publishing in the correspondence pages of the Avicultural Magazine the following comments on British Birds' Show Cages.

I would like to go on record as completely endorsing the sentiments expressed by Mr. Derek Goodwin in the March/April number with regard to the British Hardbill Show Cages.

As mentioned by Mr. Gregg in his letter these cage sizes are standardized by the British Bird and Mule Club and I think I express the feelings of a very large number of aviculturists when I say that it is high time that the above-mentioned Society altered its rules and permitted British birds to be shown in a proper sized cage. Mr. Gregg in his letter states that he thinks the cage sizes are quite right and he is, of course, fully entitled to his opinions but if he has ever looked at the British section in a show objectively, and as a whole, he will find that of all the sections this is the dullest and dreariest part of what should be one of the most attractive sections of a show.

In my opinion his argument that there is the risk of a bird damaging itself in a larger cage is entirely without foundation as foreign birds do not dash about and damage themselves in much larger cages and neither would properly trained British birds.

Another thing which affects the appearance of this section is the dreary colouring which, although presumably supposed to enhance the colour of the plumage of the birds, in actual fact just makes that section look very dull.

Anybody who has been to the average Club Bird Show, or has had anything to do with running a show, knows very well that in the average hall, all lighting is overhead and by the time that dusk has fallen which is, of course, very early in the show season, if one wishes to look at a British bird at all it is necessary to lift the cage out and tilt it in order to examine the exhibit.

I submit that this is ridiculous and, as one does not have to do it in the case of a Budgerigar, a Canary, or a foreign bird, why should it be necessary to show British birds in such dull coloured cages when it must be well-known that the lighting in the evening would be insufficient to show the birds up properly.

Also there is a very great deal of truth in Mr. Derek Goodwin's remarks about the serious damage that showing birds in these small cages does to the British Bird Fancy. In my experience a very large number of the ordinary visitors to shows are put off by the unattractive showing of birds with which they are familiar. Indeed one is often reduced to the level of having to give as much defence as one can possibly think up to justify this method of showing. Mr. Gregg states that at the National Show there is a special place where the casual visitor can find out the details as to how and why birds are to be shown, but how many casual visitors at any show do so?

I may say that I have kept and exhibited a fair number of British birds at local and open shows and have also done a certain amount of judging, so I cannot be accused, as Mr. Gregg hints, of being a "starry-eyed innocent" and I respectfully suggest that the British show cage, which, in my opinion at any rate, is a relic of the bad old days when bird shows were held in the back rooms of dubious public houses, should be done away with.

Let us show our birds under proper, clean, and attractive conditions and in cages in which the ordinary visitor to a show can see that the birds have room to turn round and not in the tiny boxes which are now used.

"Bracken,"
Cornsland,
Brentwood,
Essex.

H. Murray.

The Editor does not accept responsibility for opinions expressed in articles, notes, or correspondence.

* * *

The death of Mr. E. N. T. Vane, on May 30th 1961, is announced with great regret. An obituary notice will appear in the next number of the Magazine.

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FRANZ SZILLER, 24 Liberty Grove, Woodville Gardens, South Australia. Proposed by A. A. Prestwich.

MRS. EDITH TAYLOR, 2569 99th Avenue, Oakland 3, Calif., U.S.A. Proposed by Miss K. Bonner.

H. THOMAS, 54 WINDSOR ROAD, UTTOXETER, Staffs. Proposed by A. A. Prestwich.

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MRS. I. B. WHITE, Church Avenue, Sherborne, Dorset. Proposed by Miss K. Bonner.

HARRIS H. WILLIAMS, Carrera de San Jeronimo 36, Madrid, Spain. Proposed by Mrs. A. Erlanger.

NEW MEMBERS

The forty-six Candidates for Election in the March–April, 1961, number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

RE-ADMITTED

NEIL MACLEOD, Earl Court, Plymouth, Montserrat, West Indies.

C. R. PARTRIDGE, 75 The Cottages, Stony Hills, Nr. Ware, Herts.

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JAMES BRADLEY, Pioneer Broker's, 12420 Pioneer Blvd., Norwalk, Calif., U.S.A. Proposed by Miss K. Bonner.

W. H. CHAPLIN, Broad House, Little Ormesby, Gt. Yarmouth. Proposed by B. Boning.

Miss G. A. DAVIES, 27 Penrhyn Avenue, Littleover Lane, Derby. Proposed by Miss K. Bonner.

ERIC A. DRACUP, 21 Millbrook Road, Bedford. Proposed by Miss K. Bonner.

JOHN D. DUNSTONE, Post Office, St. Andrews, Victoria, Australia. Proposed by A. A. Prestwich.

JAMES R. HALL, 384a Rectory Road, Hawkwell, Hockley, Essex. Proposed by A. A. Prestwich.

S. HAYMAN, 10 Berkrolles Avenue, St. Athan, Nr. Barry, Glam. Proposed by Miss K. Bonner.

JOHN E. HOLZBACH, 229 Maywood Drive, Youngstown 12, Ohio, U.S.A. Proposed by A. A. Prestwich.

GILBERT J. HOSKING, 6147 Ventura Street, Sacramento 22, Calif., U.S.A. Proposed by A. A. Prestwich.

ARTHUR J. LEE, The White Orchard, Churchill, Somerset. Proposed by A. A. Prestwich.

ROBERT LEONARD, P.O. Box 60, Union City, New Jersey, U.S.A. Proposed by Miss K. Bonner.

CECIL L. PETTIT, 4037 Peppertree Lane, San Jose 27, Calif., U.S.A. Proposed by W. B. Frostick.

JOHN A. PURVES, 5 Meadow Place, Edinburgh 9. Proposed by A. A. Prestwich.

ROBERT R. RYMILL, Penola Station, Penola, South Australia. Proposed by A. A. Prestwich.

Mrs. MARY A. SUMPTER, P.O. Box 8014, 4752 Hazelbrook Avenue, Long Beach 8, Calif., U.S.A. Proposed by Otis Wade.

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CHANGES OF ADDRESS

W. G. Baird, to Chief Post Office, Palmerston North, New Zealand.
Professor Val Clear, to 303 Cottage Avenue, Anderson, Indiana, U.S.A.
Frank Y. Larkin, to Vineyard Lane, Greenwich, Connecticut, U.S.A.
A. J. Lawrence, to 89 The Readings, Harlow New Town, Essex.
John Moir, to 45 Meadow Close, Clifton, Nr. Preston, Lancs.
D. F. Palmer, to "Ettune" 431a Unthank Road, Norwich, Norfolk.
K. E. L. Simmons, to 50 Roslyn Road, Woodley, Reading, Berks.
Irvine B. Watkins, Jr., to Phelps Dodge Copper Products Corporation, Room 312, Florida Fritle Building, Jacksonville, Florida, U.S.A.
Mrs. C. J. White, to Point Cottage, Porth Navas, Falmouth.

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